UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/682,390	10/09/2003	Shu Xia Tan	CA920030042US1	8379

		EXAMINER
7590 01/03/2007		INGBERG, TODD D
Diana L. Roberts		
Intellectual Property Law		ART UNIT / PAPER NUMBER
International Business Machines		
11400 Burnet Road		ART UNIT: 2193
Austin, TX 78758		PAPER NUMBER:

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/03/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

PTOL-90A (Rev. 10/06)

	Application No.	Applicant(s)
Office Action Summary	10/682,390	TAN ET AL.
	Examiner	Art Unit	
	Todd Ingberg	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>28 September 2006</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>6-11 and 17-24</u> is/are pending in the application.

    4a) Of the above claim(s) <u>1-5 and 12-16</u> is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>28 September 2006</u> is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Claims 6-11, 17 – 24 have been examined.

Claims 1 – 5, 12-16, have been canceled.

Claims 6,10, 11, 17 and 18 have been amended.

Claims 19 - 24 have been added.

Priority

1.   Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers

have been placed of record in the file.

Drawings

2.   The new drawings filed September 28, 2006 have been accepted.

Specification

3.   The title of the invention is not descriptive. A new title is required that is clearly

indicative of the invention to which the claims are directed.

The following title is suggested: "**DEBUGGING OPTIMIZED FLOWS WITH BREAKPOINT**

USING A VARIABLE TO ENSURE AN INDICATION A BREAKPOINT IS TO BE TRIGGERED"

The Examiner has entered this of record. If the Applicant would like to propose a change, please

submit the change with the response to Office action.

Claim Rejections - 35 USC § 101

4.   35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or
> any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and
> requirements of this title.

Claims 1 - 18 are rejected under 35 U.S.C. 101 because the claimed invention is

directed to non-statutory subject matter. The current focus of the Patent Office in regard to

statutory inventions under 35 U.S.C. § 101 for method claims and claims that recite a judicial

exception (software) is that the claimed invention recite a practical application. Practical

application can be provided by a physical transformation or a useful, concrete and tangible

result. No physical transformation is recited and additionally, the final result of the claim is

generating a document which is not a tangible result because the claim does not claim

writing, storing or updating to a computer readable medium. The following link on the

World Wide Web is for the United States Patent And Trademark Office (USPTO) policy on

35 U.S.C. §101.

<http://www.uspto.gov/web/offices/pac/dapp/opla/preognotice/guidelines101_20051026.pdf>
The stack of claim 6 can be modified to be tangibly embodied on a computer readable medium.

Allowable Subject Matter

5.   Once the issues above are resolved. The claimed invention contains allowable subject

matter. The means of ensuring the optimized flow under debugger control as claimed is

allowable.

Claim 6
A method of debugging a user defined flow of a program by executing an optimized flow that as
derived from a the user defined flow, each of said optimized flow and said user defined flow
comprising a plurality of nodes connected by a plurality of connections, said method comprising:
constructing a stack associated with a terminal of a given node of said plurality of nodes in said
optimized flow, said terminal connecting to a given optimized flow connection of said plurality
of connections in said optimized flow, where said given optimized flow connection is associated
with at least one user flow connection of said plurality of connections in said user defined flow;
reporting imminent execution of said given optimized flow connection; receiving an instruction
to push an indication of a particular user flow connection, among said at least one user flow
connection associated with said given optimized flow connection, into said stack, the indication

enabling the user to debug the user defined flow; and responsive to receiving said instruction to push, push said indication of said particular user flow connection into said stack such that the user can debug the program code using the indication.

Claim 7
The method of claim 6 further comprising: receiving an instruction to delay said execution of said given optimized flow connection; and responsive to receiving said instruction to delay, delaying said execution of said given optimized flow connection pending receipt of a corresponding resume instruction.

Claim 8
The method of claim 6 further comprising: receiving an instruction to resume said execution of said given optimized flow connection; and responsive to receiving said instruction to resume, resuming said execution of said given optimized flow connection.

Claim 9
The method of claim 6 further comprising constructing a new stack associated with said terminal of said given node for each iteration of a loop.

Claim 10
A runtime for executing an optimized flow that is derived from a user defined flow, the execution of the optimized flow being used by a user to debug the user defined flow, each of said optimized flow and said user defined flow comprising a plurality of nodes connected by a plurality of connections, said runtime operable to: construct a stack associated with a terminal of a given node of said plurality of nodes in said optimized flow, said terminal connecting to a given optimized flow connection of said plurality of connections in said optimized flow, where said given optimized flow connection is associated with at least one user flow connection of said plurality of connections in said user defined flow; report imminent execution of said given optimized flow connection; receive an instruction to push an indication of a particular user flow connection, among said at least one user flow connection associated with said given optimized flow connection, into said stack, the indication enabling the user to debug the user defined flow: and push said indication of said particular user flow connection into said stack so that the user can debug the user defined flow.

Claim 11
A computer readable medium containing computer executable instructions which, when performed by a processor in a computer system for executing an optimized flow that is derived from a user defined flow, that is used to debug the user defined flow. each of said optimized flow and said user defined flow comprising a plurality of nodes connected by a plurality of connections, cause said computer system to: construct a stack associated with a terminal of a given node of said plurality of nodes in said optimized flow, said terminal connecting to a given optimized flow connection of said plurality of connections in said optimized flow, where said given optimized flow connection is associated with at least one user flow connection of said plurality of connections in said user defined flow; report imminent execution of said given

optimized flow connection; receive an instruction to push an indication of a particular user flow connection, among said at least one user flow connection associated with said given optimized flow connection, into said   the indication enabling the user to debug the user defined flow; and push said indication of said particular user flow connection into said stack so that the user can debug the user defined flow.

Claim 17
A debugger for debugging a user defined flow that has been compiled into an optimized flow, each of said optimized flow and said user defined flow comprising a plurality of nodes connected by a plurality of connections, said debugger operable to: receive a report, from a runtime, of imminent execution of a given optimized flow connection of said plurality of connections in said optimized flow; query said runtime to identify at least one user flow connection of said plurality of connections in said user defined flow associated with said given optimized flow connection; determine whether a breakpoint has been placed on a first user flow connection of said at least one user flow connection in said user defined flow; in response to determining whether a breakpoint has been placed, determine whether an indication of said first user flow connection exists' in a stack associated with a terminal of a given node of said plurality of nodes in said optimized flow, said terminal connecting to said given optimized flow connection; and in response to determining whether an indication of said first user flow connection. instruct said runtime to push an indication of said first user flow connection into said stack.

Claim 18
A computer readable medium containing computer executable instructions that, when performed by a processor in a computer system for debugging a user defined flow that has been compiled into an optimized flow, each of said optimized flow arid said user defined flow comprising a plurality of nodes connected by a plurality of connections, cause said computer system to: receive a report, from a runtime, of imminent execution of a given optimized flow connection of said plurality of connections in said optimized flow;
query said runtime to identify at least one user flow connection of said plurality of connections in said user defined flow associated with said given optimized flow connection; determine whether a breakpoint has been placed on a first user flow connection of said at least one user flow connection in said user defined flow; in response to determining whether a breakpoint has been placed, determine whether an indication of said first user flow connection exists in a stack associated with a terminal of a given node of said plurality of nodes in said optimized flow, said terminal connecting to said given optimized flow connection; and in response to determining whether an indication of said first user flow connection, instruct said runtime to push an indication of said first user flow connection into said stack.

Claim 19
A method of debugging a program code, the program code including at least one node having a breakpoint and a variable, the breakpoint for allowing a user to use a value of the variable to debug the program code, the method comprising: generating an optimized flow from the program code, the generated optimized flow having at least two optimized nodes derived from the one node having the breakpoint; executing the optimized code; ensuring that two values of the

variable are stored during execution of the optimized code, each one of the values being stored when one of the at least two optimized nodes is traversed; and debugging the program code using the two stored values of the variable.

Claim 20
The method of Claim 19 wherein the at least two optimized nodes are derived from the one node having the breakpoint when there is a loop in the program code that includes at least a first and second branches of code such that during a first iteration of the loop the first branch of code is traversed and during a second iteration of the loop the second branch of code is traversed and the node having the breakpoint is traversed at both the first and second iterations of the loop.

Claim 21
A computer program product on a storage-type computer readable medium for allowing a user to debug a program code, the program code including at least one node having a breakpoint and, a variable, the breakpoint for allowing a user to use a value of the variable to debug the program code, the computer program product comprising: code means for generating an optimized flow from the program code, the generated optimized flow having at least two optimized nodes derived from the one node having the breakpoint; code means for executing the optimized code; code means for ensuring that two values of the variable are stored during execution of the optimized code, each one of the values being stored when one of the at least two optimized nodes is traversed thereby allowing the user to debug the program code using the stored values of the variable.

Claim 22
The computer program product of Claim 21 wherein the at least two optimized nodes are derived from the one node having the breakpoint when there is a loop in the program code that includes at least a first and second branches of code such that during a first iteration of the loop the first branch of code is traversed and during a second iteration of the loop the second branch of code is traversed and the node having the breakpoint is traversed at both the first and second iterations of the loop.

Claim 23
A computer system being used to debug a program code, the program code including at least one node having a breakpoint and a variable, the breakpoint for allowing a user to use a value of the variable to debug the program code, the computer system comprising: a storage device to store code data; and a processor for processing the code data to generate an optimized flow from the program code, the generated optimized flow having at least two optimized nodes derived from the one node having the breakpoint, to execute the optimized code, to ensure that two values of the variable are stoned during execution of the optimized code, each one of the values being stored when one of the at least two optimized nodes is traversed, the two stored values of the variable enabling the user to debug the program code.

Claim 24

The computer system of Claim 23 wherein the at least two optimized nodes are derived from the one node having the breakpoint when there is a loop in the program code that includes at least a first and second branches of code such that during a first iteration of the loop the first branch of code is traversed and during a second iteration of the loop the second branch of code is traversed and the node having the breakpoint is traversed at both the first and second iterations of the loop.

Conclusion

6.   Applicant's amendment necessitated the new ground(s) of rejection presented in this

Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this
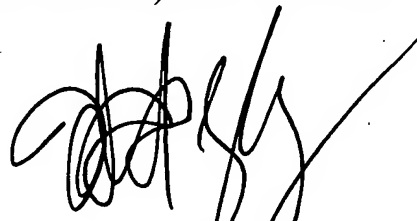
final action.

Correspondence Information

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Todd Ingberg whose telephone number is (571) 272-3723. The

examiner can normally be reached on during the work week..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

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system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Todd Ingberg
Primary Examiner
Art Unit 2193

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